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(54) PRODUCTION OF ALUMINA SINGLE CRYSTAL

(57)Abstract:

PURPOSE: To suppress overcooling in compsn. and to obtain an alumina single crystal having excellent optical characteristics by growing the single crystal while accelerating the convection of an aluminum oxide melt incorporated with a transition metal.

CONSTITUTION: The single crystal is grown while the convection of the melt is accelerated in a process of producing the aluminum oxide single crystal incorporated with the transition metal by a melting and solidifying method and more particularly a rotational pulling up method. A method for impressing a magnetic field and more particularly a perpendicular magnetic field on the melt, a method for controlling the oxygen partial pressure of a growth atmosphere to $\leq 10-2$ atm or a method of making combination use thereof, etc., are adoptable as the method of accelerating the melt convection. The single crystal having a large diameter and high quality is grown without impairing the characteristics of the rotational pulling up method in particular in this process for producing the single crystal.

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